

11-355382
Amendment dated 09/27/2004

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The following is a complete listing of all claims in the application, with an indication of the status of each:

Listing of claims:

- 1 1. (currently amended) A packet switch for controlling flow of data in a
2 network, comprising:
3 a plurality of input ports;
4 a plurality of output ports;
5 a scheduler having N (natural number) in number of input port
6 scheduling modules reserving a particular input port among said plurality of
7 input ports for feeding data to a designated output port among said plurality of
8 output ports and determining connecting condition between said input port
9 and said output port, each said input port scheduling module being a current
10 scheduling module in relation to a preceding stage and a next stage,
11 in said scheduler, each of said input port scheduling ~~module~~ modules
12 receiving reservation condition information of a certain time slot from the
13 input port scheduling module in the preceding stage and determining
14 permission or rejection of reservation of packet transmission from said
15 preceding stage input port scheduling module in said reservation time slot, per
16 time slot
17 each of said current scheduling modules ~~module~~ including
18 means for reservation of packet transmission ~~referring~~ referring the
19 reservation condition information received from the scheduling module in the
20 preceding ~~preceding~~ stage and the ~~reservation~~ reservation request of ~~own~~ said
21 current scheduling module and transmitting the result of said reservation of
22 packet transmission to the scheduling module in the next stage;

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23 means for defining a frame consisted of N in number of time slots and
24 performing reservation in N time slots in a next frame in a current frame
25 period;
26 means, in the current scheduling module, for receiving said reservation
27 condition information from the preceding scheduling module;
28 means, in the current scheduling module, for preliminarily determining
29 a future time slot to access one of said plurality of output ports as the
30 particular time slot in the next frame;
31 means for selecting one of said plurality of output ports for reservation
32 for transmitting in said future time slot;
33 means for making judgment whether said future time slot has already
34 been reserved by ~~other~~ another scheduling module;
35 means for making reservation of said future time slot when said future
36 time slot is not reserved by ~~other~~ another scheduling module and putting
37 information ~~indicative~~ indicating that said future time slot is reserved in said
38 reservation condition information;
39 means for transferring said reservation condition information to next
40 input port scheduling module,
41 considering in viewpoint of reservation process in the time slot,
42 said reservation process being initiated simultaneously at the leading
43 end of the frame, being progressed simultaneously in pipeline process, and
44 completing simultaneously at the end of the frame;
45 each said input port scheduling module having
46 means for initiating process for respectively different reservation time
47 slot in the next frame in each of a plurality of said reservation processes which
48 are initiated simultaneously at the leading end of the frame; and
49 ~~reservation order varying~~ means for varying an order of said
50 ~~reservation~~ reservations by said plurality of scheduling ~~module~~ modules,

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51 said plurality of input port scheduling modules making reservation of
52 ports to output with respect to a packet for next frame per each frame in the
53 varied order.

1 2. (original) A packet switch as set forth in claim 1, wherein said plurality of
2 scheduling modules performs said reservation in an order corresponding to
3 logical connection order relative to other modules, said reservation order
4 varying means varies a connection topology of said plurality of scheduling
5 modules.

1 3. (original) A packet switch as set forth in claim 1, wherein said reservation
2 order varying means includes a switch performing switching operation for
3 varying logical connecting condition of said plurality of scheduling modules
4 and a table storing control data for controlling switching operation of said
5 switch.

1 4. (currently amended) A packet switch as set forth in claim 3, wherein
2 physical connection between said plurality of scheduling ~~module~~ modules and
3 said varying switch is an electrical connection.

1 5. (currently amended) A packet switch as set forth in claim 3, wherein
2 physical connection between said plurality of scheduling ~~module~~ modules and
3 said varying switch is an optical connection.

1 6. (original) A packet switch as set forth in claim 3, wherein said table is
2 provided in each of said plurality of scheduling modules.

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1 7. (original) A packet switch as set forth in claim 3, wherein said table is
2 provide in common for said plurality of scheduling modules.

1 8. (currently amended) A packet switch as set forth in claim 3, wherein said
2 control data is data for controlling switching operation of said switch for
3 varying time ~~slot~~slots for initiating reservation of said plurality of scheduling
4 modules per each frame at the leading end of each frame.

1 9. (currently amended) A packet switch as set forth in claim 3, wherein said
2 control data is data for realizing scheduling equalizing use frequency of
3 reservation start ~~slot~~slots for initiating said reservation by a plurality of
4 scheduling modules.

1 10. (currently amended) A packet switch as set forth in claim 3, wherein said
2 control data is data for realizing scheduling equalizing use order and use
3 frequency of reservation start ~~slot~~slots for initiating said reservation by a
4 plurality of scheduling modules.

1 11. (currently amended) A packet switching method for determining
2 connecting condition between input ports and output ports by making
3 reservation for particular input port among a plurality of input ports for
4 feeding data to a designated output port among a plurality of output ports in a
5 scheduler of a switch having N in number of input port scheduling modules,
6 each said input port scheduling module being a current scheduling module in
7 relation to a preceding stage and a next stage, comprising:
8 step of receiving reservation condition information of a certain time
9 slot from the input port scheduling module in the preceding stage;

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10 step of determining permission or rejection of reservation of packet
11 transmission from said preceding stage input port scheduling module in said
12 reservation time slot, per time slot
13 step of ~~reservatin~~reservation of packet transmission ~~referring~~referring
14 the reservation condition information received from the scheduling module in
15 the preceding stage and the reservation request of ~~own~~the current scheduling
16 module and transmitting the result of said reservation of packet transmission
17 to the scheduling module in the next stage ;
18 ~~step of means, in the current scheduling module, for receiving by the~~
19 current scheduling module said reservation condition information from the
20 preceding scheduling module;
21 ~~step of means, in the current scheduling module, for preliminarily~~
22 determining by the current scheduling module a future time slot to access one
23 of said plurality of output ports as the particular time slot in the next frame;
24 step of selecting one of said plurality of output ports for reservation for
25 transmitting in said future time slot;
26 step of making judgment whether said future time slot has already been
27 reserved by ~~other~~another scheduling module;
28 step of making reservation of said future time slot when said future
29 time slot is not reserved by ~~other~~another scheduling module and putting
30 information ~~indicative~~indicating that said future time slot is reserved in said
31 reservation condition information;
32 step of transferring said reservation condition information to next
33 scheduling module,
34 considering in viewpoint of reservation process in the time slot,
35 said reservation process being initiated simultaneously at the leading
36 end of the frame, being progressed simultaneously in pipeline process, and
37 completing simultaneously at the end of the frame;

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38 step of initiating process for respectively different reservation time slot
39 in the next frame in each of a plurality of said reservation processes which are
40 initiated simultaneously at the leading end of the frame; and
41 ~~reservation order varying~~ step of varying an order of said ~~reservation~~
42 reservations by said plurality of scheduling ~~module~~ modules, and making
43 reservation of ports to output with respect to a packet for next frame per each
44 frame in the varied order.

1 12. (currently amended) A packet switching method as set forth in claim 11,
2 wherein said plurality of scheduling modules performs said reservation in an
3 order corresponding to logical connection order relative to other modules, said
4 reservation order varying means ~~varies~~ varying a connection topology of said
5 plurality of scheduling modules.

1 13. (original) A packet switching method as set forth in claim 11, wherein
2 said reservation order varying means includes a switch performing switching
3 operation for varying logical connecting condition of said plurality of
4 scheduling modules and a table storing control data for controlling switching
5 operation of said switch.

1 14. (currently amended) A packet switching method as set forth in claim 13,
2 wherein physical connection between said plurality of scheduling ~~module~~
3 modules and said varying switch is an electrical connection.

1 15. (currently amended) A packet switching method as set forth in claim 13,
2 wherein physical connection between said plurality of scheduling ~~module~~
3 modules and said varying switch is an optical connection.

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1 16. (original) A packet switching method as set forth in claim 13, wherein
2 said table is provided in each of said plurality of scheduling modules.

1 17. (original) A packet switching method as set forth in claim 13, wherein
2 said table is provide in common for said plurality of scheduling modules.

1 18. (currently amended) A packet switching method as set forth in claim 13,
2 wherein said control data is data for controlling switching operation of said
3 switch for varying time ~~slot~~slots for initiating reservation of said plurality of
4 scheduling modules per each frame at the leading end of each frame.

1 19. (currently amended) A packet switching method as set forth in claim 13,
2 wherein said control data is data for realizing scheduling equalizing use
3 frequency of reservation start ~~slot~~slots for initiating said reservation by a
4 plurality of scheduling modules.

1 20. (currently amended) A packet switching method as set forth in claim 13,
2 wherein said control data is data for realizing scheduling equalizing use order
3 and use frequency of reservation start ~~slot~~slots for initiating said reservation
4 by a plurality of scheduling modules.